

REMARKS

Claims 1 through 24 are pending in this application. Claims 1, 9 and 17 are the independent claims.

Claims 1-2, 9-10 and 17-18 were rejected under 35 U.S.C. § 102(e) as being anticipated by Talluri et al., U.S. Patent No. 5,884,313. Claims 3, 4, 11, 12, 19 and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Talluri in view of Osborne, U.S. Patent No. 6,078,733. Claims 5, 6, 13, 14, 21 and 22 are rejected under 35 U.S.C. § 103 (a) as being unpatentable over Talluri in view of Osborne and further in view of Krishnan et al., U.S. Patent No. 4,922,416. Claims 7, 8, 15, 16, 23 and 24 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Talluri in view of Osborne and further in view of Krishnan et al. and Chow et al, U.S. Patent No. 6,052,387.

35 U.S.C. §§ 102(e) and 103(a) Rejections

Claims 1, 2, 9, 10, 17 and 18 are rejected under 35 U.S.C. § 102(e) as being anticipated by Talluri.

It is noted that rDMA is a term of art and is not mentioned at all in the Talluri reference. In the most recent Office Action, the Response to Arguments section provides the following argument,

“Talluri explicitly discloses the server receiving a remote data read request and the server performing a DMA operation. Talluri further references that a remote write operation can be performed in the same manner except for a minor change of the request message now indicates the write operation to be performed instead of the read operation. Therefore, Talluri indeed identifies the request as a rDMA read operation (column 3, lines 45-65, column 4, lines 9-11, 35-40, column 5, lines 1-13, 15-20, column 8, lines 5-8, 35-45, column 9, lines 26-31).”

The cited sections of Talluri are addressed below.

Col. 3, lines 45-65 is taken from the Background section of Talluri. In this section it is described how Node B is to read data from Node A. An IMMU entry is made in a buffer at Node B that maps a physical address range for Node B with a global address range. Accordingly, when sending the read request message to Node A, the global address (relevant to Node B) is included in the message (see Col. 4, lines 5-6).

Col. 4, lines 9-11 and lines 35-40 are also taken from the Background section of Talluri. The read request message is received by Node A, and the server (i.e., Node A) sets up an OMMU entry which maps a global address range with a physical address range for the Node A server. To transfer the data from Node A to Node B, the data needs to be provided to NIC 60 (Fig. 1). This may be done using two DMA operations. The first (lines 21-25) is a DMA transfer from the disk/disk controller (elements 66 and 64 in Fig. 1) to local memory (RAM 56 in Fig. 1). The second (lines 32-37) is a transfer from local memory to the communications interface (NIC 60 in Fig. 1).

Col. 5, lines 1-13 and lines 15-20 refer to the Summary of the Invention section of Talluri. The operation for transferring data between Nodes A and B is much the same as described in the Background section discussed above. A key difference is that only one DMA transfer takes place, namely between the disk controller 55 and the NIC 60 (see lines 23-26).

Col. 8, lines 5-8 and 35-45 refer to the Description section of Talluri and further elaborate the Summary section. Accordingly, the DMA operation referred to at Col. 8, line 3 is referring to the DMA transfer from the disk controller of Node A to the network interface of Node A (see Col. 7, lines 40-43). Once the data is received by the network interface of Node A, it can then be transmitted to Node B.

Col. 9, lines 26-31 explicitly refer to a write operation as mimicking the read operation described in Fig. 7 and discussed above.

The references to DMA in Talluri are exclusively to transfers within components of a single Node (e.g., a server). With respect to independent claims 1, 9 and 17, there is no description or teaching in Talluri that a message received at Node A is processed to determine whether the transport header identifies the message as a type of rDMA operation. There is no description or teaching in Talluri that Node A performs an rDMA operation with Node B.

The Osborne, Krishnan and Chow references fail to make up for the deficiencies of Talluri. Osborne refers to message processing. Contrary to the assertions made in the Office Action, there is no disclosure in the cited section of Osborne concerning the handling of rDMA read or write messages in a Virtual Interface or otherwise. It appears from the text of the Office Action that the Krishnan reference has been cited to show a last data segment and completion of a rDMA request and that Chow shows a last buffer bit. These three references taken individually or in combination with Talluri fail to teach or suggest determining whether a message indicates a rDMA read operation and performing a rDMA write operation in accordance with data elements included in the message as called for in each of the pending claims. Accordingly, reconsideration and withdrawal of the rejection of claims 1-24 under 35 U.S.C. §§ 102(e) and 103(a) is respectfully requested.

CONCLUSION

In view of the above remarks, the Applicant respectfully submits that the present case is in condition for allowance and requests that the Examiner issue a notice of allowance to that effect for all currently pending claims.


Applicants authorize the Commissioner to charge any fees determined to be due under 37 C.F.R. § 1.16 or § 1.17 or credit any overpayment to Deposit Account No. 11-0600.

The Examiner is invited to contact the undersigned at (202) 220-4255 to discuss any matter concerning this application.

Respectfully submitted,

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